CX200

Desktop Label Printer

Section

1

General Information

1-1 Overview

The SATO CX Series Printers are compact desktop printers designed especially for bar code labeling and tagging. The CX uses SATO Command Language, making it simple to integrate with any other SATO printer models. Designed for convenience the CX has many advanced features like larger media capacity, user replaceable print head and platen, and a high lift print head carriage that makes it easy to clean and load supplies.

This manual covers in detail:

CX200DT and CX200TT

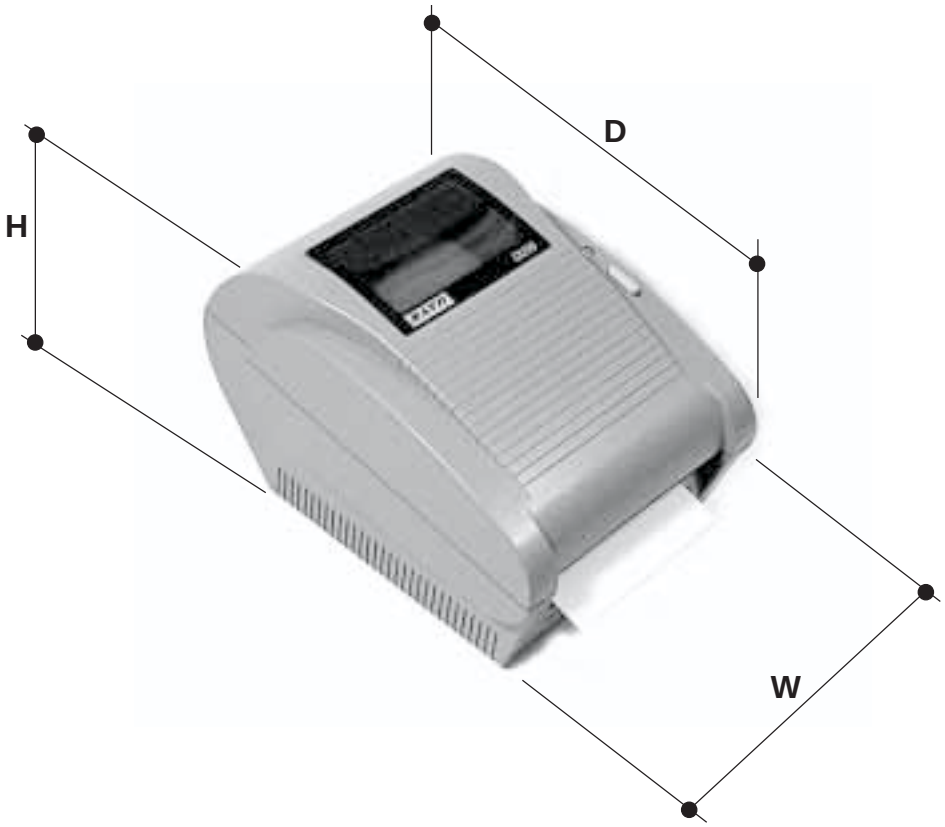
Direct Thermal and Thermal Transfer Units

Features include:

- 4.1 inch Wide Print Area
- Label Width From 2 inches to 4.65 inches
- Up To 3 inches Per Second Print Speed
- 203 DPI Resolution
- 512K Flash and 512K RAM Memory
- 2Mb or 4Mb Expanded Memory
- 12 Proportional and Mono-spaced Fonts
- 14 Bar Code Symbologies, Including 2D
- Parallel and Serial Interfaces

Step-by-step maintenance instructions are described in this manual. It is recommended that you become familiar with each section before installing and maintaining your printer.

1-2 Dimensions

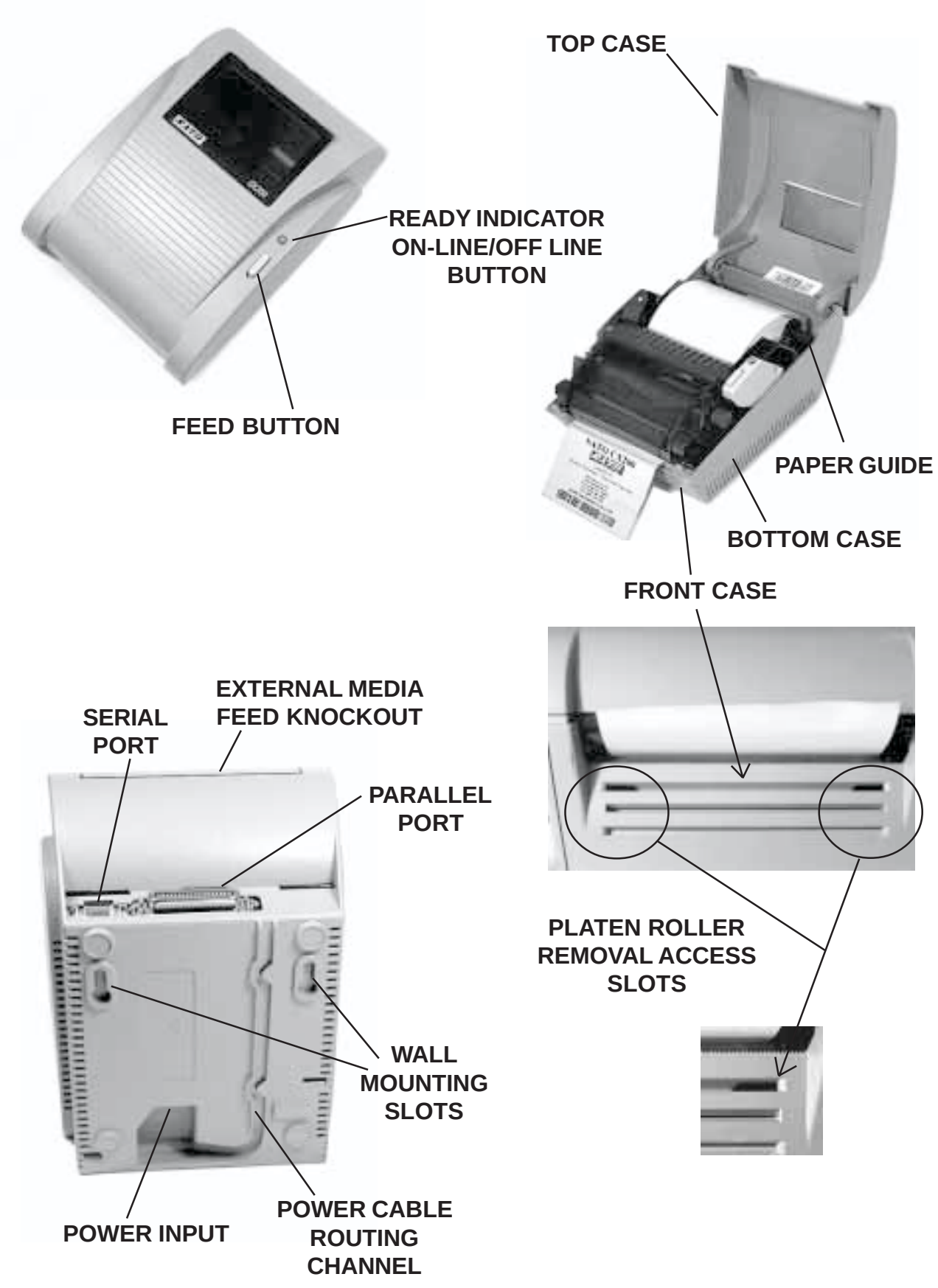


	CX200DT	CX200TT
Weight	3.1lb./1.41 kg	3.6 lb./1.63 kg
Depth	10 in. (254 mm)	
Heigth	6.6 in (168 mm)	
Width	6.9 in. (175 mm)	

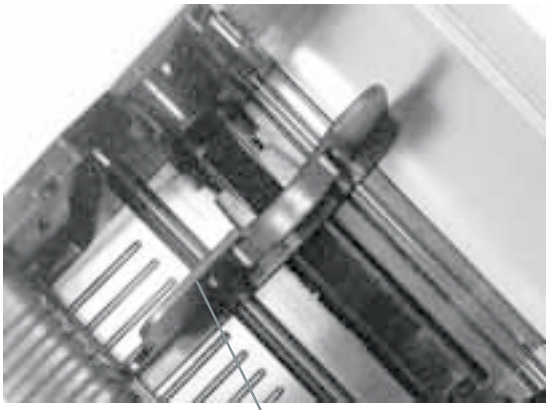
1-3 Specifications

Model	CX200DT/CX200TT
Print Method	Direct Thermal/Thermal Transfer
Resolution	203 dpi 8 dpmm
Max. Media Width	4.65 inches 118 mm
Min Media Width	2.0 inches 51 mm
Max. Print Width	4.1 inches 104 mm
Max. Print Length	14 inches 356 mm
Max. Print Speed	3 ips 76 mm/s
Installed RAM	512 KB, non-volatile
Installed ROM	512 KB, Flash
Communications	RS232C Serial and Centronics Parallel
Max. Media Roll OD	5.0 inches 127 mm
Ribbon	460 feet (140m) Wax, Wax/Resin 418 feet (127m) Resin 0.5 inch core, Coated Side Out
Label Sensing method	Eye-Mark, Gap or Notch, Fixed Position
Minimum Form Length	0.375 inches 9.5 mm
Text Fonts	12 proportional and monospaced fonts up to 12X expansion
Graphics	PCX and SATO Hex/Binary
Bar Codes	UPC-A/E, EAN-8/13, UCC/EAN-128, Bookland, Code 39, I 2 of 5, Code 128, Codabar, Plessey, MSI, Code 93, Postnet, PDF417, Maxicode
Rotation	Text and bar codes can be rotated in four 90^{o} increments
Power	20-26 VAC 50/60 Hz or 18-26 VDC 120 VAC 50/60 Hz 230 VAC 50/60 Hz 40 W power supply provided with printer
Environmental	Operating: 41^{o} to 104^{o} F (5^{o} to 40^{o} C) Storage: - 4^{o} to 122^{o} F (-20^{o} to 50^{o} C) RH: 25 to 85% non-condensing

1-4 Attributes



1-4 Attributes



PAPER GUIDE (SHOWN WITHOUT LABELS)

PAPER GUIDE (SHOWN WITH LABELS)

RELEASE LEVERS FOR PRINT HEAD/RIBBON MECHANISM

1-5 Controls, Indicators and Connections

The following table summarizes the functions of the various printer controls, indicators, and connections.

DEVICE NAME	PRIMARY FUNCTION	USE
FEED button	Advances print media	***PRESS*** - to advance media ***PRESS*** while pressing READY indicator-to print test label ***PRESS*** to pause printing during batch mode operation
READY indicator	Shows print status	***GREEN*** - Printer ready for data ***OFF*** - Printer busy, or Off-Line ***RED*** - Printer needs attention
ON-OFF line	Places printer in On-Line or Off-Line mode	***PRESS*** to switch to/from Off-Line or to reset the printer
Power input	Connects to power supply	***Connect*** to power supply provided with printer
Serial port	Data input	***DB9*** female connector for connection to host controller, RS232 interface
Parallel port	Data input	***Centronics*** compatible connector for connection to host controller
Print head release	Unlocks print head	***Push*** both releases toward rear of printer to release print head
Media cover	Protects print media mechanism	***Lift*** to open Push outward at hinge to remove

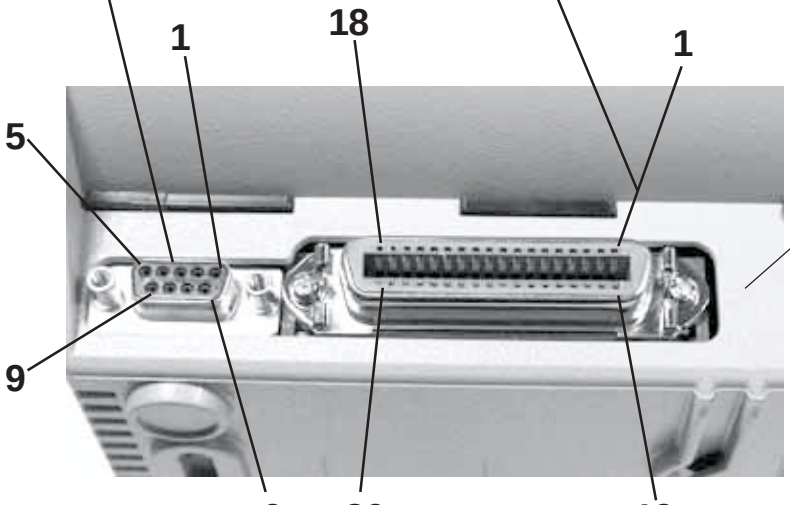
1-5 Controls, Indicators and Connections

PIN #	DESCRIPTION
2	RXD (printer data input)
3	TXD (printer data output)
5	Ground
7	RTS (printer busy)
8	CTS
1,9	+5 VDC, 200 mA max

PIN #	DESCRIPTION
1	Strobe
2-9	Data bits 0-7
10	Acknowledge
11	Busy
12	Out of paper
13	+5 VDC
14-15	No connection
17	Chassis ground
18	+5 VDC
31	Reset
32	Error
16,33 19-30	Signal Ground
34-36	No connection

SERIAL INPUT CONNECTOR DB9S

PARALLEL INPUT CONNECTOR CENTRONICS 36 PIN



BACK END OF PRINTER

1-5 Controls, Indicators and Connections

Printer Power Connection

1. Plug the output of the AC power supply provided with the printer into the connector on the underside of the printer.

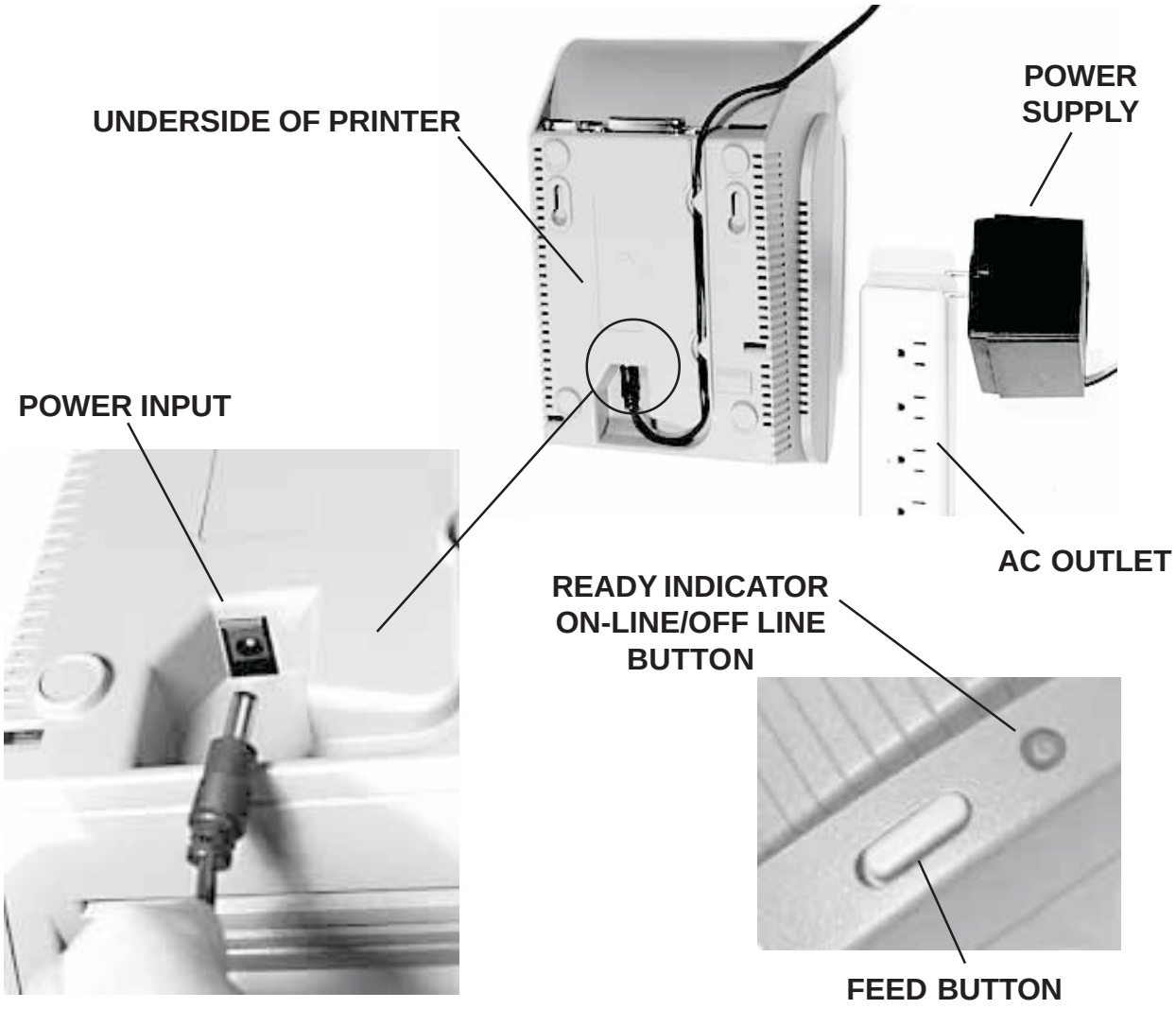
2. Plug the supply into an AC outlet having the correct voltage.

   Important!

   The required AC voltage is marked on the power supply. Confirm that your AC voltage matches the power supply requirements. ***Do not use any power supply other then the one provided with the printer***.

Note:

CX200 printers consume very little power when idle so are not equipped with a power switch. Press the READY indicator/ON-OFF (a combined control) to reset the printer and switch from OFF-Line to On-Line mode.



1-5 Controls, Indicators and Connections

Connecting the Interface Cable

AVAILABLE DB9S SERIAL PORT

PARALLEL PORT

CONNECT THIS END OF THE CENTRONICS 36 PIN CABLE TO THE PARALLEL PORT ON THE PRINTER

CONNECT THIS END OF THE PARALLEL CABLE TO THE PORT ON THE COMPUTER

1-6 Printer Setup
Loading Labels or Tags

ALSO REFER TO THE ACCOMPANYING ILLUSTRATIONS (NEXT PAGE)

1. Lift open the top case.

2. Press the two print head releases toward the rear of the printer to unlock the print head. The print head will pop up slightly. Lift it up until it is fully raised.

3. Remove print media (if any) or empty core from the printer.

4. Unwrap the new media and unwind a few labels from the roll. Labels must be wound face-in for best results.

5. Slide the paper guide all the way to the right.

6. Place media roll in the tray so that the media unwinds from the bottom of the roll toward the front of the printer. The label imaging surface must face up as it passes under the print head.

7. Lift the print head and slip the free end of the media under the print head.

8. Adjust the paper guide until the media is snug between the paper guide and the left side of the paper tray.

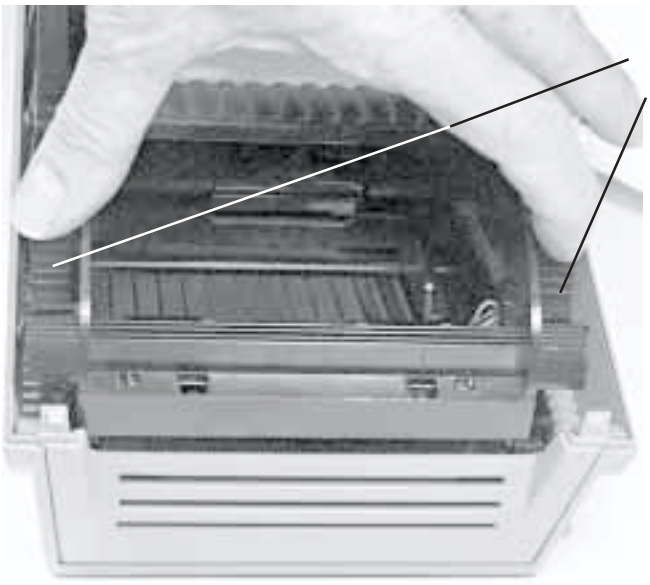
9. Lower the print head and press it down firmly until it locks closed on both sides.

10. Close the top case.

11. Wait until the Ready Indicator glows green, then press the FEED button to feed a label or to resume printing.

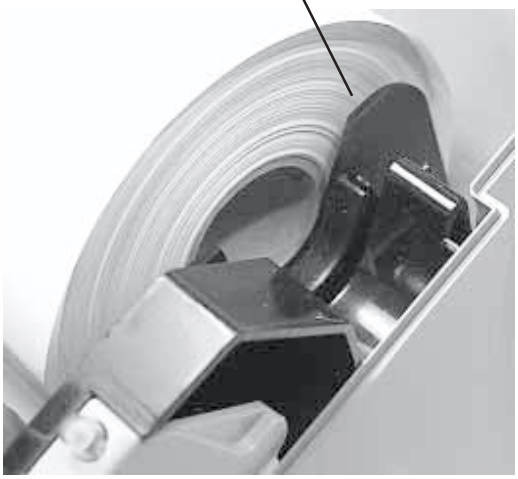
12. If the printer feeds out 7 inches of label and stops and the indicator glows red, recalibrate for the media installed. See calibration.

1-6 Printer Setup
Loading Labels or Tags

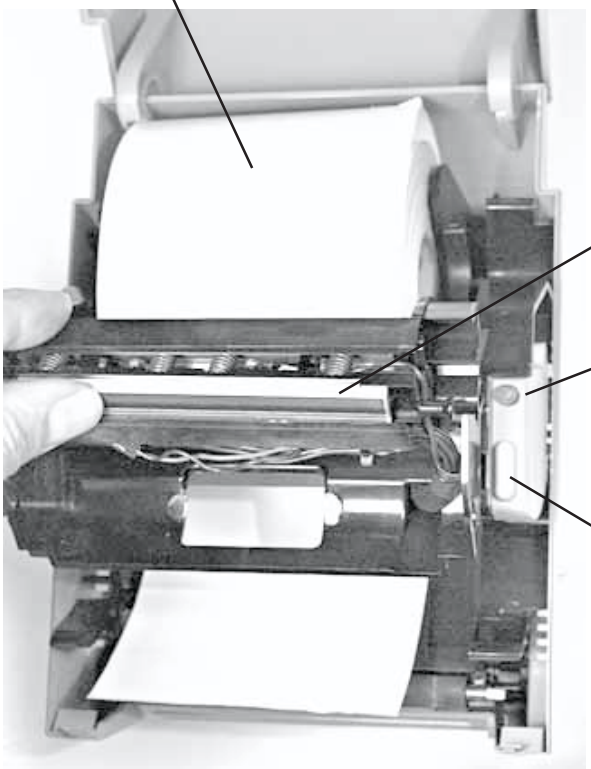


PRESS BACK THE
RELEASES TO UNLOCK

PAPER GUIDE



MEDIA ROLL



LIFT PRINT HEAD AND
SLIDE UNDER MEDIA

READY
INDICATOR

FEED BUTTON

1-6 Printer Setup

Loading Ribbon

The CX200TT Thermal Transfer Printer transfers ink from a ribbon to the label to produce an image.

Ribbon is N/A for CX200DT

ALSO REFER TO THE ACCOMPANYING ILLUSTRATIONS

1. Lift open the top cover.

2. Press the two print head releases toward the rear of the printer to unlock the printhead. The print head will pop up slightly. Lift it up until it is fully raised.

3. Unwrap the new ribbon and unwind about 4" from the roll. The end of the ribbon is attached to a take-up core.

4. Observe the notches on both ends of the supply core and the take-up core. These notches must fit on the corresponding nibs on both the supply and take-up spindles.

5. Roll several turns of ribbon on the take-up core, winding to the underside as shown. The dull (coated) side of the ribbon must be on the outside of the take-up roll.

6. Place the take-up core (ribbon unrolling from the top side) into the left take-up spindle, lining up the notches with the spindle nibs. The take-up spindles are the take-up spindles.

7. Pull out the spring loaded knob on the right take-up spindle and place the right end of the take-up core into the right spindle, lining up the notches with the spindle nibs.

8. Pull the ribbon down and over the print head and insert the supply core onto the left supply spindle, making sure the notches in the core fit over the nibs.

9. Pull out the spring loaded knob on the right supply spindle and place the right end of the supply core into the right spindle, lining up the notches with the spindle nibs.

Note:
Make sure the (coated) dull side of the ribbon is to the outside where it will be in contact with the label media.

1-6 Printer Setup
Loading Ribbon (Continued)

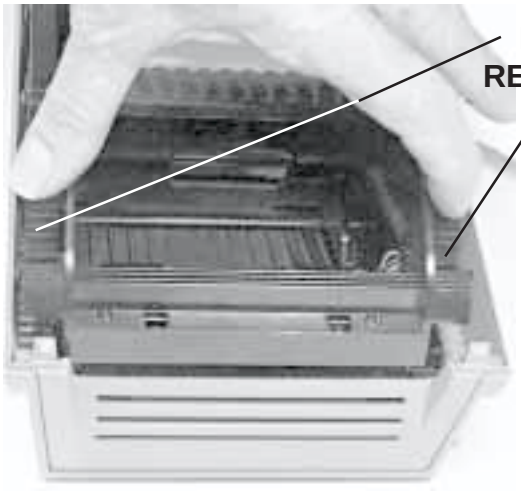
10. Turn the take-up knob to pull the ribbon over the print head without any slack. Check to make sure there are no ribbon wrinkles.

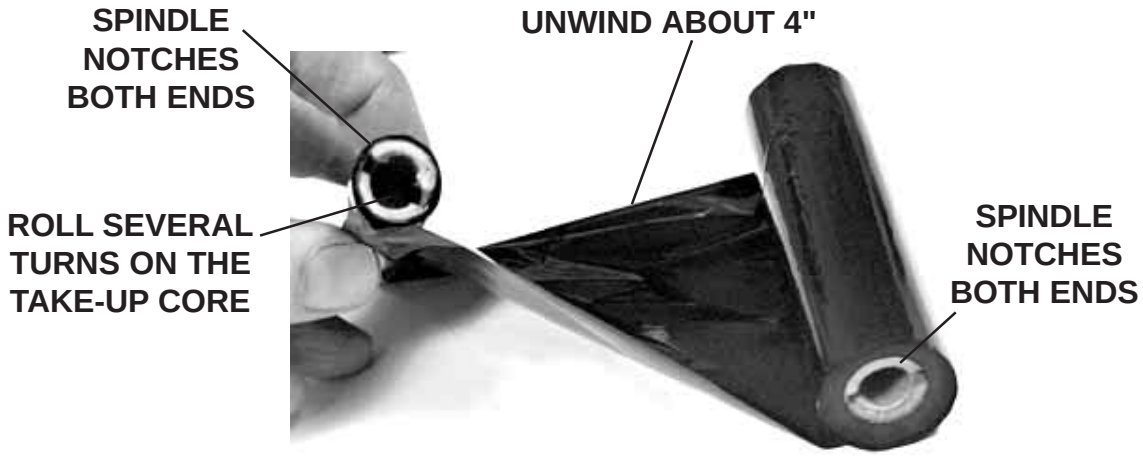
11. Lower the print head and press it down firmly until it locks closed on both sides.

12. Close the top case.

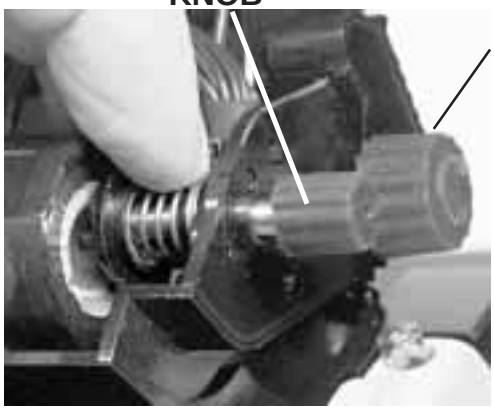
13. Wait until the Ready Indicator glows green and press the FEED button to feed a label or to resume printing.

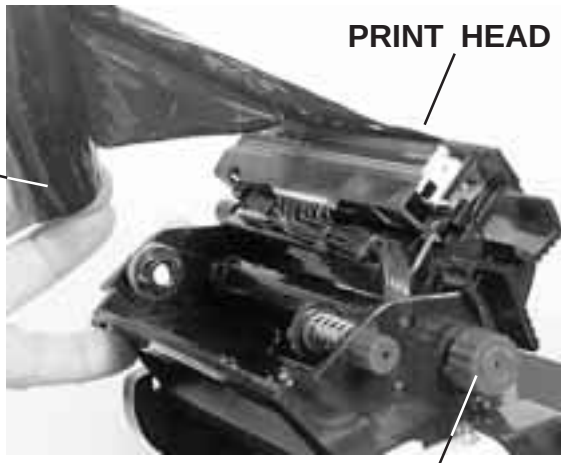
14. If the printer feeds out 7 inches of label and stops, and the indicator glows red, recalibrate for the media installed. See calibration.

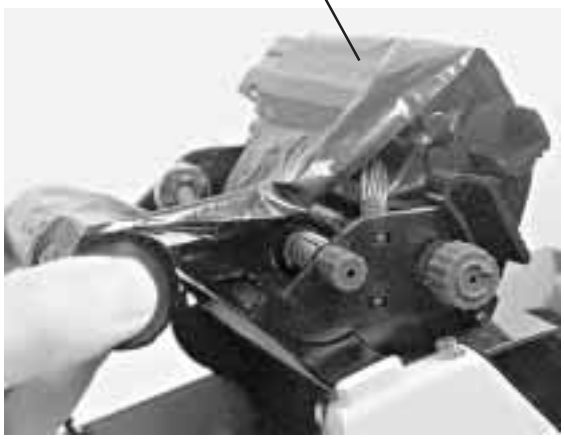




1-6 Printer Setup
Loading Ribbon (Continued)







1-6 Printer Setup
Loading Ribbon (Continued)

TURN RIBBON TAKE-UP KNOB CLOCKWISE TO ELIMINATE RIBBON SLACK

LOWER THE PRINT HEAD AND PRESS DOWN FIRMLY ON BOTH HEAD LATCHES TO LOCK THE PRINT HEAD IN POSITION

Selecting the Label Sensor Type

CX200 printers support Eye-Mark, gap, or notch label sensing. The printer must be set for the proper sensing method. If you are using label printing software, it should provide a means to set up these parameters. See your software documentation for details. If you are writing your own software or controlling the printer using direct commands, you must use printer commands to set up the print mode and sensing method. Refer to the programming manual.

1-7 Printer Test and Calibration
Preparation for Test

These procedures run a complete set of performance tests. If the printer fails a test, troubleshoot as required, then rerun all tests.

Inspect the printer for physical damage before testing or calibrating it. Inspect for:

- Cuts or gouges in the rubber drive roller
- Dust buildup or other obstructions of the label sensor or sensor LED
- Adhesive buildup or scratches on the print head
- Adhesive buildup or other obstructions in the paper path
- Any other physical damage that might affect printer alignment

Correct any problems found before beginning the printer calibration using the calibration software.

> *NOTE:*
> *The calibration software is DOS-based and can be run directly from the diskette or installed on your hard drive. You must run the software from the DOS prompt. If using Windows 95, reboot your computer in MS-DOS mode. Do not try to run the software in a window.*

Installing the software to your hard drive:

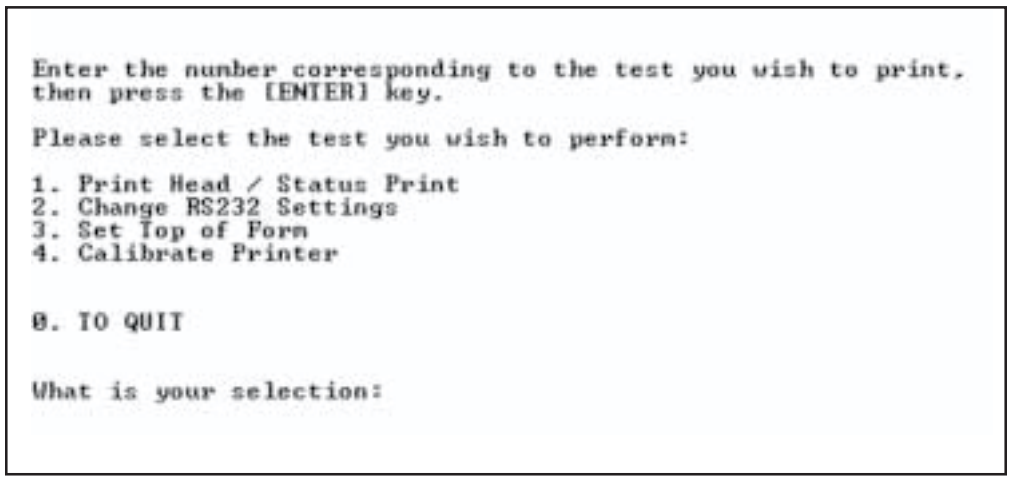
1. At the DOS prompt, insert the calibration disk in your computer's 3-1/2 disk drive and access the drive.
2. At the prompt, type ***dir*** and press the ***Enter*** key.
3. Copy the file ***CX200.exe*** to your hard drive.
4. Type ***CX200.exe*** to view the opening screen. Refer to the following pages to continue with the program.

1-7 Printer Test and Calibration
Preparation for Test

Running the software from your 3-1/2 drive

1. At the DOS prompt, insert the calibration disk in your computer's 3-1/2 disk drive and access the drive.

2. At the prompt, type ***CX200.exe*** *and* press the ***Enter*** key. The opening screen will appear.


Enter the number corresponding to the test you wish to print,
then press the [ENTER] key.
Please select the test you wish to perform:
1. Print Head / Status Print
2. Change RS232 Settings
3. Set Top of Form
4. Calibrate Printer
0. TO QUIT
What is your selection:

Review the menu and make your selection. At the prompt, type 1, 2, 3, 4, or to exit the program type 0.

Description of Test Menu

1. Print Head / Status Print - Prints head pattern status. Refer to illustration on page 26

2. Change RS232 Settings - Sets the RS232 settings through the LPT1 port

3. Set Top of Form - Positions the label towards or away from the sensor.

4. Calibrate Printer - Calibrates printer to current label and/or ribbon installed in the machine.

1-7 Printer Test and Calibration
Print Head / Status Print

Access the software

1. Enter 1 at the prompt.

```
Enter the number corresponding to the test you wish to print,
then press the [ENTER] key.

Please select the test you wish to perform:

1. Print Head / Status Print
2. Change RS232 Settings
3. Set Top of Form
4. Calibrate Printer


0. TO QUIT

What is your selection: 1
```

2. As the sequential screens appear, respond to the prompts.

```
**************************************************
****                                          ****
****  Make sure that for a CX200DT you have   ****
****  your Direct Thermal labels installed.   ****
****                                          ****
****  Make sure that for a CX200TT you have   ****
****    your labels and ribbon installed.     ****
****                                          ****
****         Press any key when ready.        ****
****                                          ****
****
```

```
**************************************************
****                                          ****
****  Please have the printer online          ****
****  and connected to your LPT1 port.        ****
****                                          ****
****                                          ****
****      Press any key when ready            ****
****        to start the program.             ****
****                                          ****
**************************************************
```

Refer to page 26 for an example of a test label.

1-7 Printer Test and Calibration
Change RS232 Settings

Access the software

1. Enter 2 at the prompt.

```
Enter the number corresponding to the test you wish to print,
then press the [ENTER] key.

Please select the test you wish to perform:

1. Print Head / Status Print
2. Change RS232 Settings
3. Set Top of Form
4. Calibrate Printer


0. TO QUIT

What is your selection: 2
```

2. As the sequential screens appear, respond to the prompts.

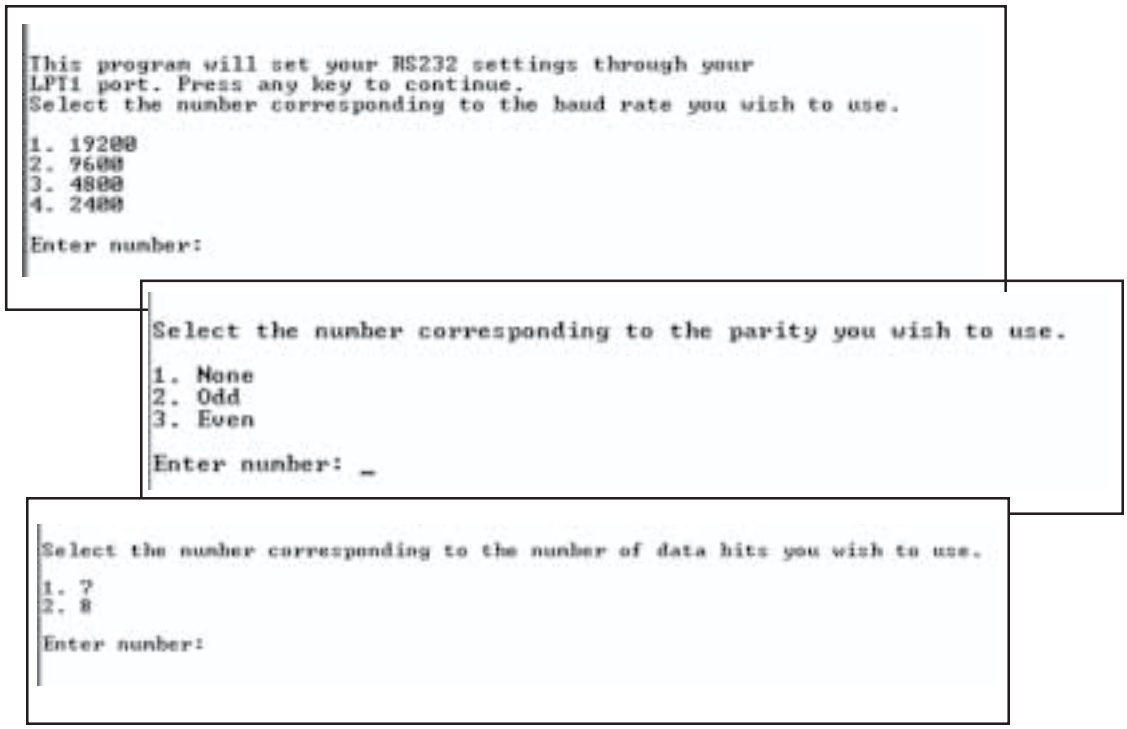
```
**********************************************
****                                      ****
****  Make sure that for a CX200DT you have  ****
****  your Direct Thermal labels installed.  ****
****                                      ****
****  Make sure that for a CX200TT you have  ****
****    your labels and ribbon installed.    ****
****                                      ****
****         Press any key when ready.        ****
****                                      ****
**********
```

```
**********************************************
****                                      ****
****  Please have the printer online      ****
****  and connected to your LPT1 port.    ****
****                                      ****
****                                      ****
****      Press any key when ready        ****
****        to start the program.         ****
****                                      ****
**********************************************
```

```
This program will set your RS232 settings through your
LPT1 port. Press any key to continue._
```

1-7 Printer Test and Calibration
Change RS232 Settings (Continued)

Continue to respond to the prompts or enter a choice on the sequential screens.


This program will set your RS232 settings through your
LPT1 port. Press any key to continue.
Select the number corresponding to the baud rate you wish to use.
1. 19200
2. 9600
3. 4800
4. 2400
Enter number:
Select the number corresponding to the parity you wish to use.
1. None
2. Odd
3. Even
Enter number: _
Select the number corresponding to the number of data bits you wish to use.
1. 7
2. 8
Enter number:

Run a test label to verify that the new RS232 parameters were entered correctly. Select *1. Print Head / Status Print* from the main menu.

1-7 Printer Test and Calibration
Set Top of Form (Pitch Offset)

Access the software

1. Enter 3 at the prompt.

```
Enter the number corresponding to the test you wish to print,
then press the [ENTER] key.

Please select the test you wish to perform:

1. Print Head / Status Print
2. Change RS232 Settings
3. Set Top of Form
4. Calibrate Printer


0. TO QUIT

What is your selection: 3
```

2. As the sequential screens appear, respond to the prompts.

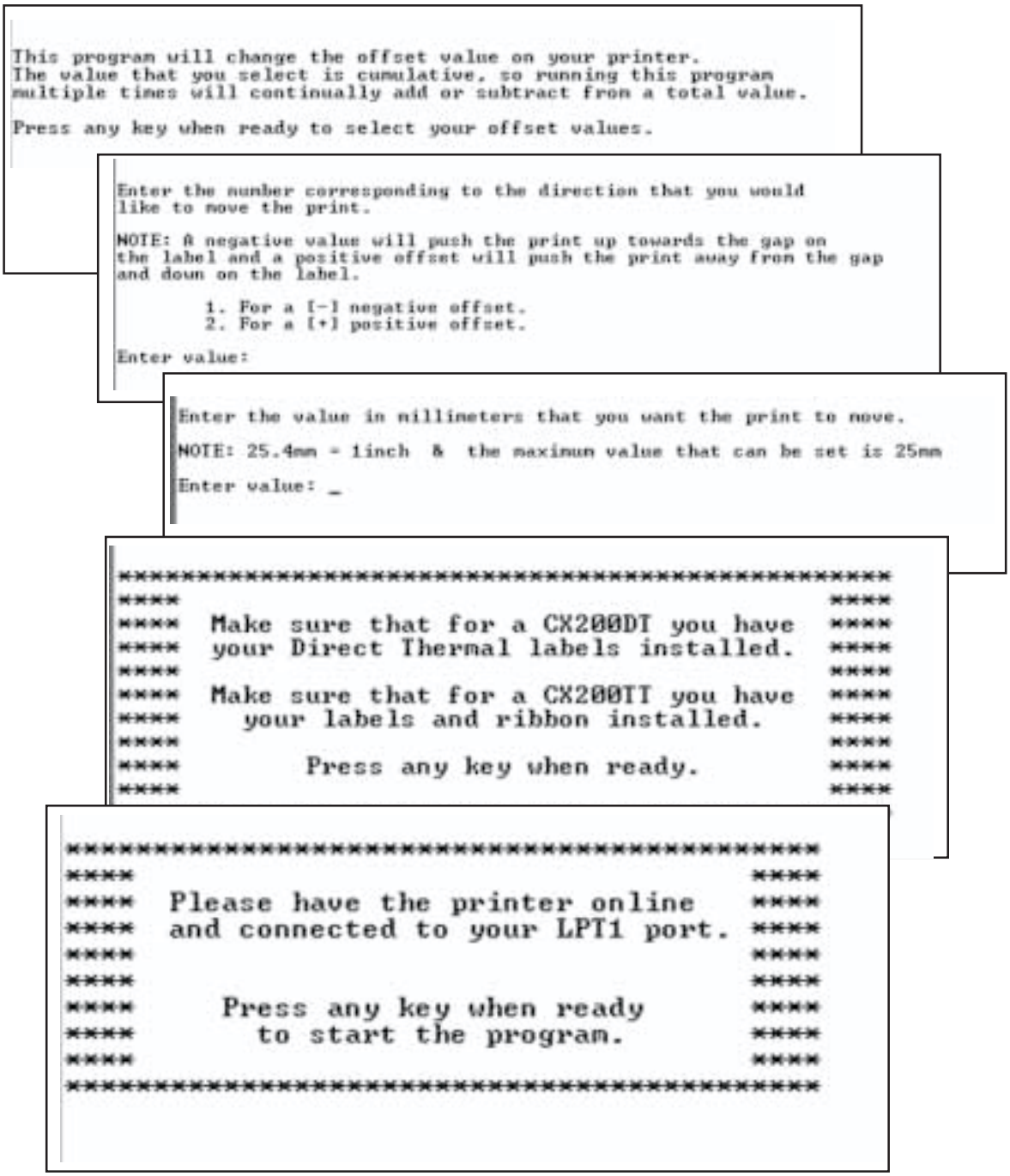
```
**************************************************
****                                          ****
****  Make sure that for a CX200DT you have   ****
****  your Direct Thermal labels installed.   ****
****                                          ****
****  Make sure that for a CX200TT you have   ****
****    your labels and ribbon installed.     ****
****                                          ****
****         Press any key when ready.        ****
****                                          ****
**********
```

```
**************************************************
****                                          ****
****  Please have the printer online          ****
****  and connected to your LPT1 port.        ****
****                                          ****
****                                          ****
****      Press any key when ready            ****
****        to start the program.             ****
****                                          ****
**************************************************
```

1-7 Printer Test and Calibration

Set Top of Form (Pitch Offset), Continued

Continue to respond to the prompts or enter a choice on the sequential screens.


This program will change the offset value on your printer.
The value that you select is cumulative, so running this program
multiple times will continually add or subtract from a total value.
Press any key when ready to select your offset values.
Enter the number corresponding to the direction that you would
like to move the print.
NOTE: A negative value will push the print up towards the gap on
the label and a positive offset will push the print away from the gap
and down on the label.
1. For a [-] negative offset.
2. For a [+] positive offset.
Enter value:
Enter the value in millimeters that you want the print to move.
NOTE: 25.4mm = 1inch & the maximum value that can be set is 25mm
Enter value: _
Make sure that for a CX200DT you have
your Direct Thermal labels installed.
Make sure that for a CX200TT you have
your labels and ribbon installed.
Press any key when ready.
Please have the printer online
and connected to your LPT1 port.
Press any key when ready
to start the program.

After the Offset command is sent to the printer, two labels are printed with a single horizontal line at a V=000 print position. The first line will be printed at the old offset position and the second at the new position. Compare them to make sure the desired change was effected. The new setting will be printed on the last line of the first label.

1-7 Printer Test and Calibration
Calibrate Printer

Access the software

1. Enter 4 at the prompt.

```
Enter the number corresponding to the test you wish to print,
then press the [ENTER] key.

Please select the test you wish to perform:

1. Print Head / Status Print
2. Change RS232 Settings
3. Set Top of Form
4. Calibrate Printer


0. TO QUIT

What is your selection: 4
```

2. As the sequential screens appear, respond to the prompts.

```
**************************************************
****                                          ****
****  Make sure that for a CX200DT you have   ****
****  your Direct Thermal labels installed.   ****
****                                          ****
****  Make sure that for a CX200TT you have   ****
****    your labels and ribbon installed.     ****
****                                          ****
****         Press any key when ready.        ****
****                                          ****
**************************************************
```

```
**********************************************
****                                      ****
****  Please have the printer online      ****
****  and connected to your LPT1 port.    ****
****                                      ****
****                                      ****
****     Press any key when ready         ****
****       to start the program.          ****
****                                      ****
**********************************************
```

1-7 Printer Test and Calibration
Calibrate Printer (Continued)

Continue to respond to the prompts or enter a choice on the sequential screens.

```
CX200 Calibration Program

  Label Gap or Notch Press 1
  Black Bar on Bottom of Liner Press 2
  If you have neither of the obove mentioned Press 3

  Select Sensor Type then Press Enter : _
```

```
CX200 Calibration Program

  Direct Thermal Press 1
  Thermal Transfer Press 2

  Select Print Mode then Press Enter : _
```

Sequence of events when the Calibration Program is run:

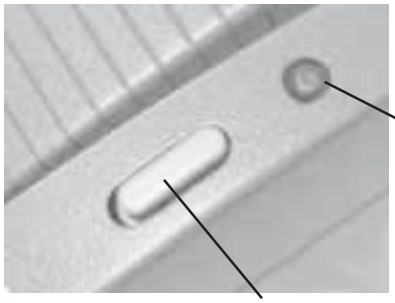
1. The Indicator goes out.
2. The motor slowly feeds a label until a gap or mark is found.
3. The indicator glows green and prints one label with the message "calibration successful".
4. If the label does not print and the indicator glows red, repeat the calibration procedure.

1-8 Basic Operations
Printing and Reading a Self-test Label

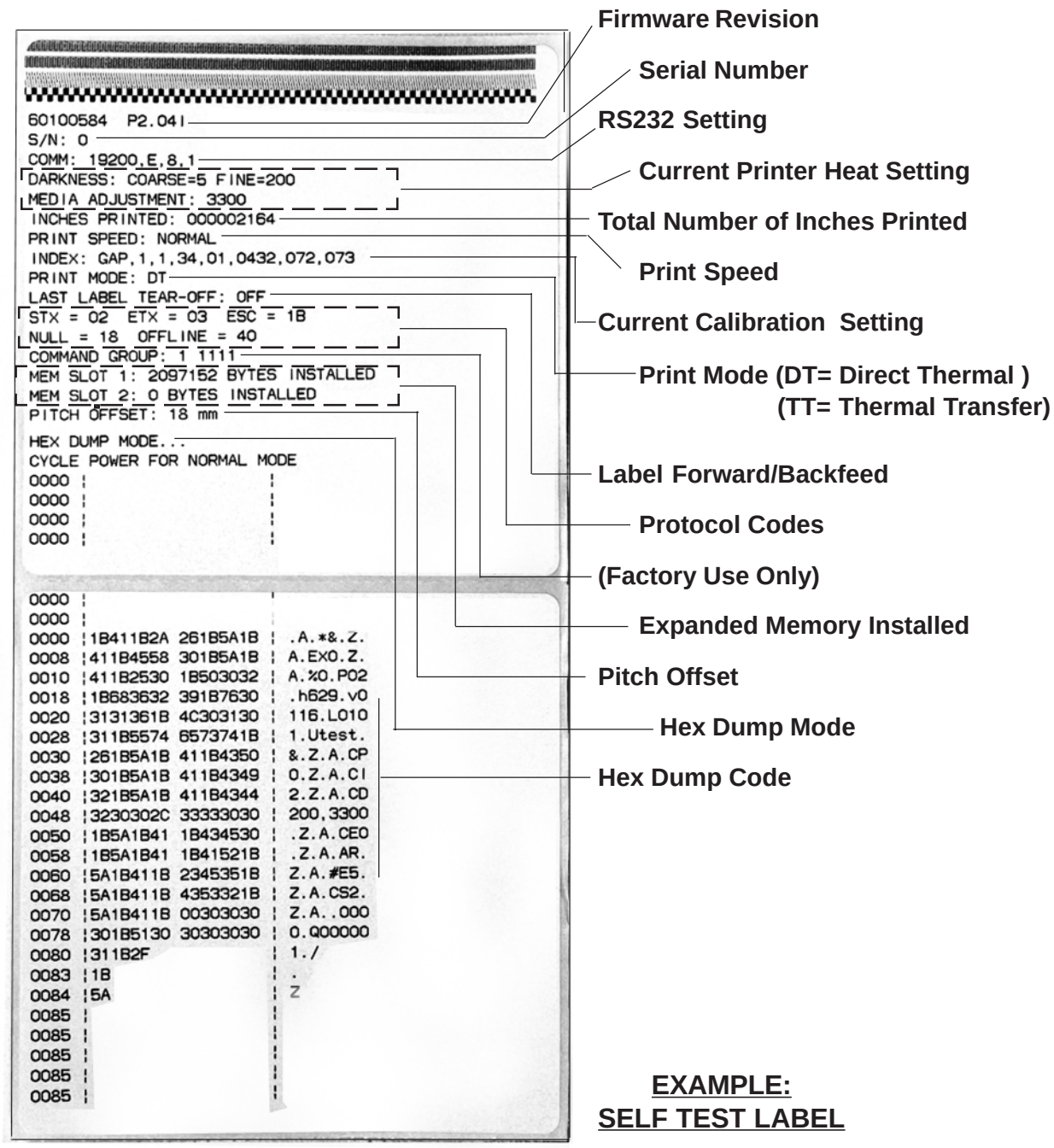
Printing a self-test label checks the printer's overall operability. To run a self-test, confirm that the printer is loaded and connected to AC power and no print jobs are in process – then:

1. Press and hold in the READY indicator.
2. Press and release the FEED button.
3. The printer should begin printing a self-test label. Release the READY indicator after printing starts.
4. After the self-test label finishes printing, press the READY indicator to reset the printer and restore normal operation.

Important!
The printer will be in hex dump mode after printing the self-test label. It cannot print normal labels in hex dump mode, instead it prints the hex value for each character received. The printer will return to normal operation after you reset it as described in step 4 above.



1-8 Basic Operations
Printing and Reading a Self-test Label



EXAMPLE:
SELF TEST LABEL

When sending data in normal operation and nothing prints, put the printer in the Hex mode and try resending the data. The printer should print out the hex characters corresponding to the data received. If nothing prints, check cabling and media. If you get a hex dump, compare it to the command stream you are sending. If it is the same, the command sent could be wrong. Refer to the Programming Guide for information on programming the printer and the correct use of the printer commands.

1-8 Basic Operations

Feeding Blank Labels

To feed a label, press and release the FEED button with the printer off-line. Press and hold in the FEED button to feed multiple labels. Note: The printer has a last label repeat feature. If this feature is enabled, pressing the Feed key with the printer on-line (READY indicator green), will repeat print any label in the buffer. If the printer is placed in the off-line mode, it automatically clears any label that is in the buffer.

Label Reprint

The printer has a last label repeat feature. If this feature is enabled and the last label printed has not been cleared from the print buffer by pressing the READY indicator to take the printer Off-Line, then pressing the FEED button will cause the last printed label to be reprinted.

Sending Data to the Printer

To print labels using data sent from a host computer or terminal:

1. Connect the host and printer serial or parallel ports together using a correctly wired interface cable, (the parallel cable supplied with the printer, or a null modem RS232 cable.)

2. If you are using the serial port, confirm that the host and printer are using the same communications parameters. The current parameters are printed out on the "comm:" line on the test label.

3. Confirm that the READY indicator is glowing green.

4. Send your data to the printer.

Printer Ready/Standby/Reset Control

CX200 printers do not have a power switch, but you can effectively "turn off" the printer by pressing the READY indicator. This resets the printer's microprocessor and places the printer in standby. Resetting the microprocessor will:

- Stop any printing.
- Delete the label format in process from memory.
- Reset the printer communication ports.
- Return all printer parameters to their default (first power-on) state.

1-8 Basic Operations

Printer Ready/Standby/Reset Control

Pressing the READY indicator a second time will return the printer to On-Line mode (its default condition). Resetting the printer in this manner does not harm it in any way, nor does it affect the contents of nonvolatile RAM or remove any stored objects. The effect is the same as if you had unplugged and reconnected the printer power supply.

Printing Labels

To print labels, the host computer sends commands to the printer via the serial or parallel communications port. If you are using the Label Wizard CX label printing software supplied on the CD-ROM (included with the printer), the computer and software control the entire printing process. You only need to set up the SATO generic printer, start your label printing program, and follow its instructions. If you are using another vendor's software package, contact the software supplier or manufacturer if you encounter difficulties. A complete Reference Manual for the Label Wizard CX label design and printing software is included on the CD-ROM. If you want to print labels from another Windows application, the CX200 Windows Printer Driver must be installed. It is found on the CD-ROM and must be loaded using the standard Windows printer installation instructions.

Controlling the Printer Using Direct Commands

You can also produce labels by sending commands directly to the printer. Simple ASCII commands control the printer. You can write command files using any text editor program that can output ASCII text (including the control codes). Since printer programming is potentially complex, programming information is not provided here. A printer command reference and basic programming procedures are provided on the CD-ROM packed with the printer. The file CXManual.pdf on the disk is in Adobe Acrobat format, readable using the Adobe Acrobat Reader provided in the AcroRead directory on the CD-ROM or can be downloaded free of charge from http://www.adobe.com. This program will allow you to search the contents of the manual and /or print a hard copy. If you need programming information and are not using Windows (or cannot read the CXManual.pdf file for any other reason), contact our Technical Support Services Organization for assistance.

Section

2

Maintenance

2-1 Cleaning

SATO America printers need very little maintenance other than occasional cleaning. Clean the printer body as required, using a soft cloth moistened with a mild detergent cleaner.

Caution!
Do not use abrasives on the printer body. The finish may be ruined.

Clean the print head if it appears dirty or if print quality is poor.
To clean the print head:

ALSO REFER TO THE ACCOMPANYING ILLUSTRATIONS

1. Lift open the top case.

2. Press the two print head releases toward the rear of the printer to unlock the print head. The print head will pop up slightly. Lift it up until it is fully raised and latched in the up position.

3. Using a SATO Direct Thermal Print Head Cleaning Sheet or a soft coth moistened with 99% pure isopropyl or denatured alcohol, clean all dirt and label residue from the print head, paying particular attention to the "burn line" (the thin black line near the front edge of the print head).

Caution!
Do not clean the print head or platen roller using abrasive or metallic objects or ammonia-based cleaners or other harsh chemicals. These practices can cause serious damage and will void the warranty.

4. Wipe the platen roller with a cleaning cloth. To reach all portions of the platen roller, press the FEED button. The roller will rotate 1/4 turn each time you press the FEED button.

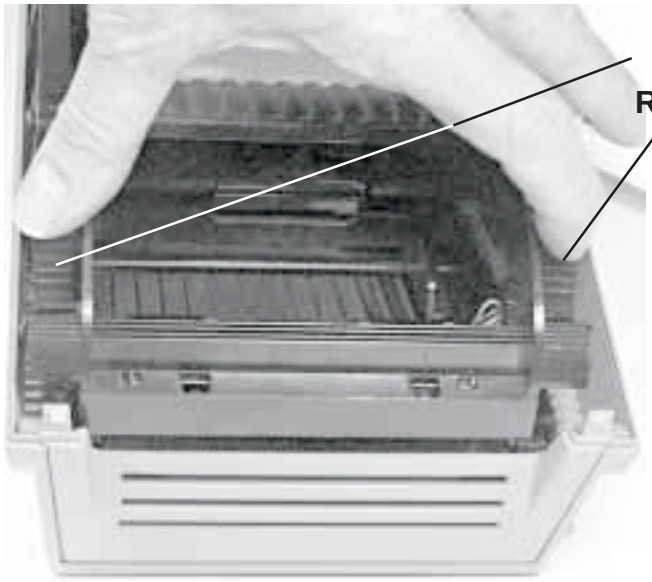
Caution!
Keep all objects clear of the platen roller when you press the FEED button.

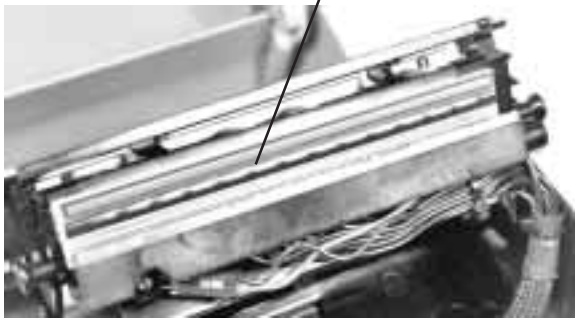
2-1 Cleaning

5. Confirm that the label sensor is unobstructed. Clean away any obstruction with a soft brush if necessary.

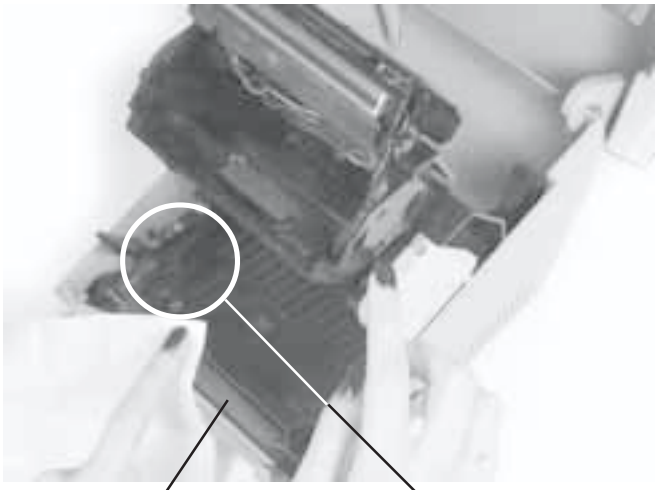
6. Resume the media loading procedure, or if there is already media in the printer, lower and lock the print head.

7. Resume normal operation.

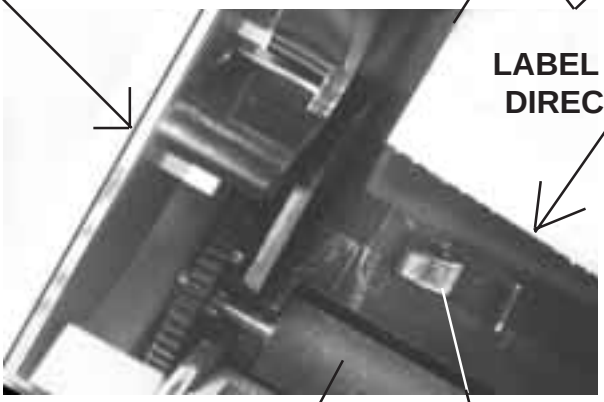




2-1 Cleaning



CLEAN THE
PLATEN ROLLER



LABEL FEED
DIRECTION

PLATEN
ROLLER

LABEL SENSOR
MUST REMAIN
UNOBSTRUCTED

Section

3

Parts Replacement

3-1 Preparing the Printer for Service

Caution!

Some of the components in the printer are extremely sensitive to static discharge damage. When servicing the printer, observe good static prevention practices.

- Place the printer on a grounded, conductive work surface.
- Ground yourself to the work surface through a 1 megohm series resistor, using a conductive wrist strap or other suitable device.
- Ground any tools that will contact the equipment (holding the conductive portion of the tools can provide a suitable ground).
- Keep replacement components in their protective packing until they are needed, and do not handle unnecessrily.

After repairs are completed:

After making the necessary repairs, reconnect the printer power supply and reinstall the print media. Confirm that the printer status LED glows green, and that the printer will feed a label when you press the FEED button.

3-2 Replaceable Parts

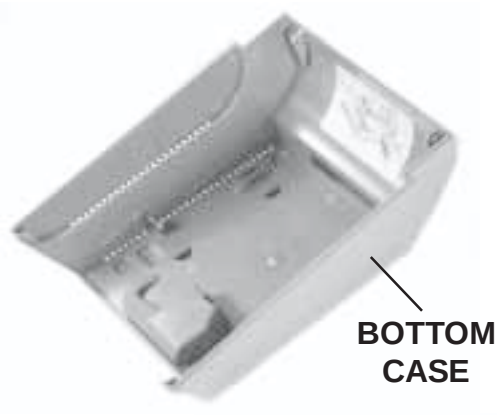
The following is a list of replaceable parts covered in these instructions.

SECTION	DESCRIPTION	KIT PART NUMBER
3-3	TOP CASE	14SC00116
3-4	BOTTOM CASE	14SC00114
3-4	FRONT CASE	14SC00117
3-5	PLATEN	14SC00111
3-6	PRINT HEAD	14SC00101
3-7	PCBA MODULE 512K	14SC00110
3-8	PCA BASE BOARD	14SC00120
3-9	MOTOR	14SC00105
3-10	SWITCH	14SC00104
3-11	GEAR CLUSTER	14SC00109

Refer to the Section Number for method of replacement

3-2 Replaceable Parts

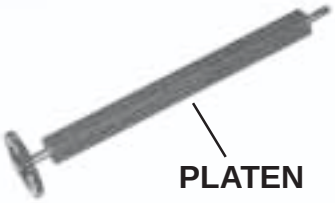
TOP CASE



BOTTOM CASE

PRINT HEAD

FRONT CASE

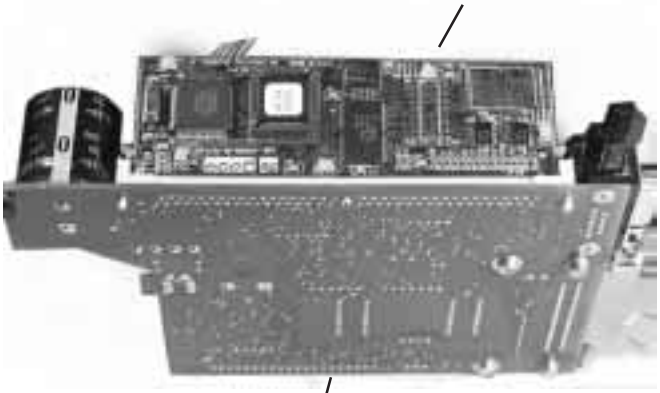


PLATEN

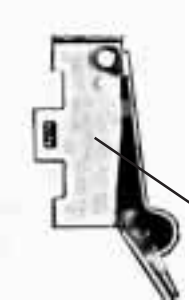
GEAR CLUSTER

MOTOR

PCBA MODULE

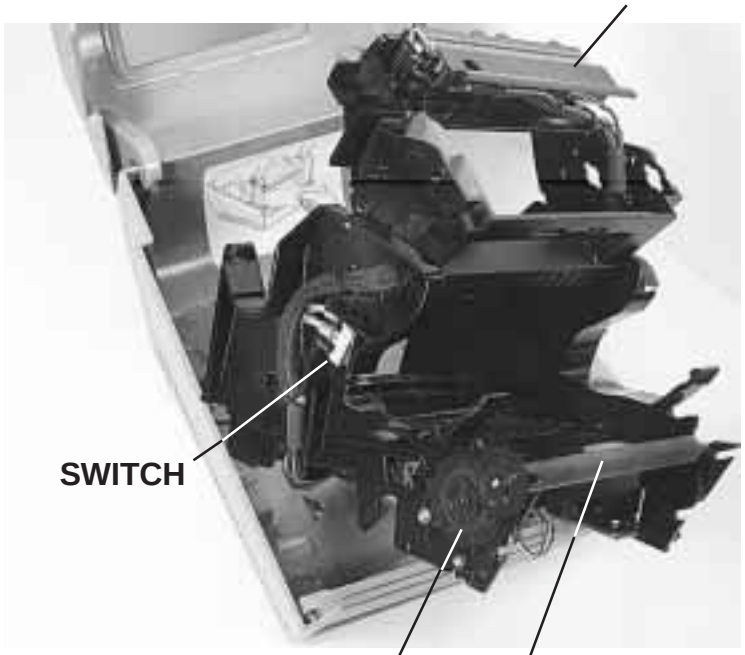


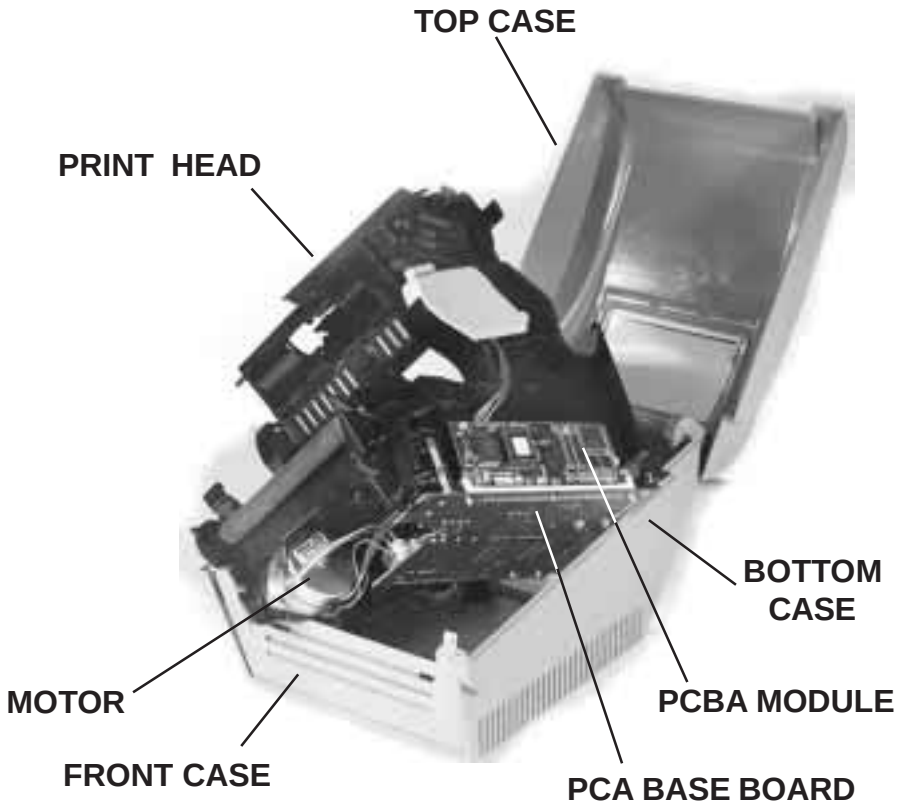
PCA BASE BOARD



SWITCH

3-2 Replaceable Parts Location



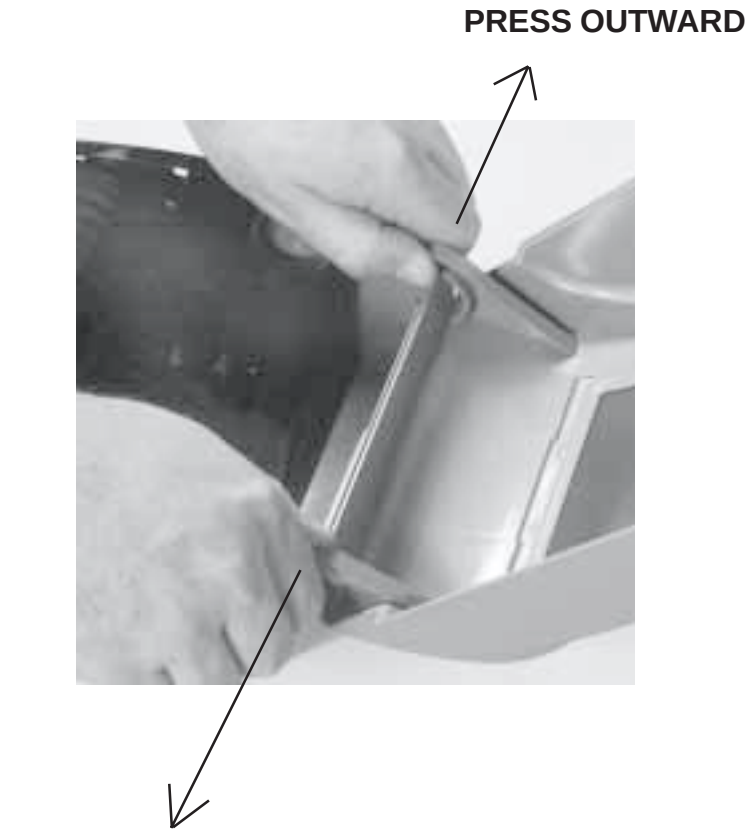


3-3 Top Case Removal/Replacement

REFER TO THE ILLUSTRATION

1. Lift open the top case

2. Press the two sides of the top case outward to unlatch from the bottom case, and remove.



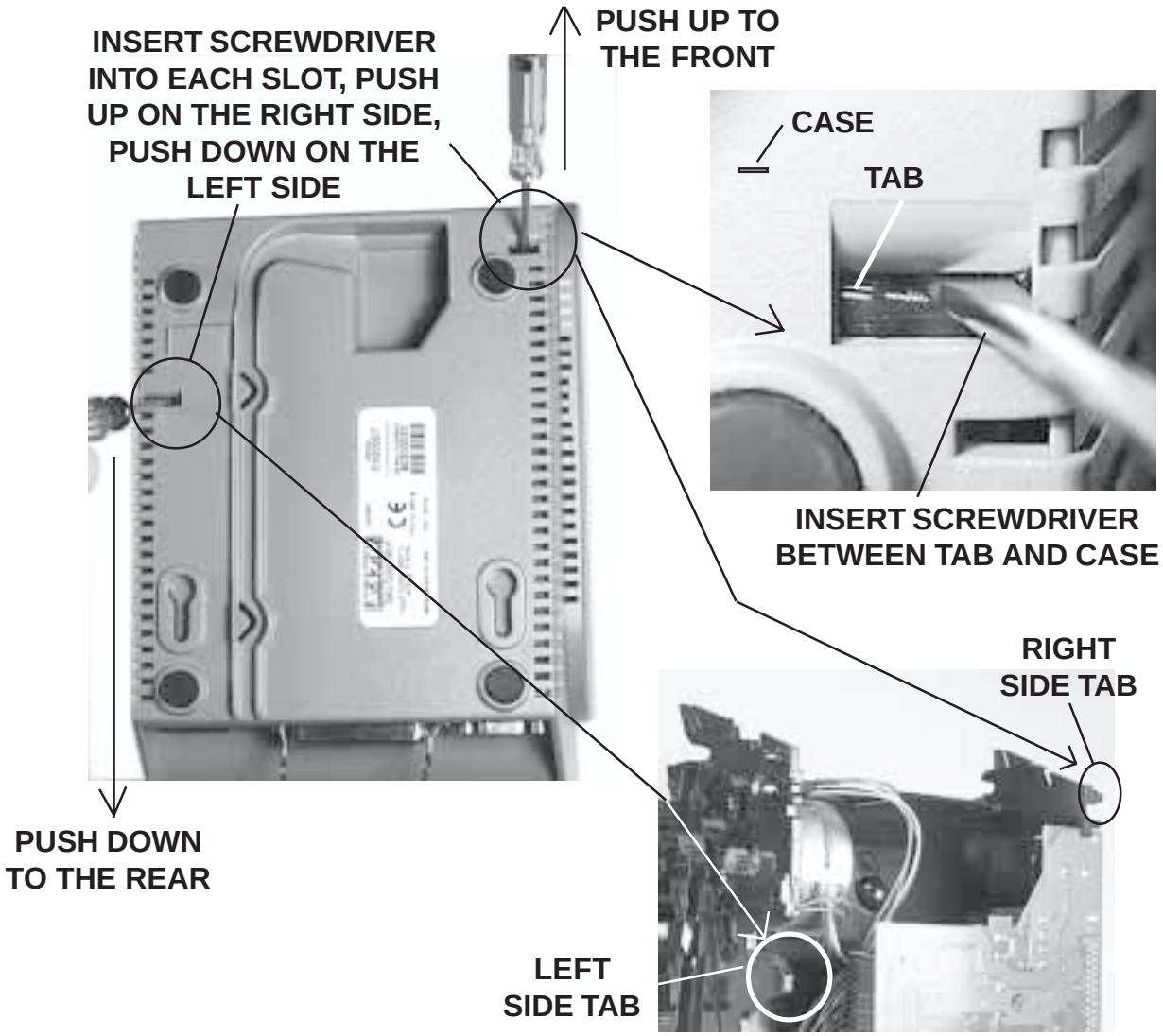
3-4 Chassis, Including the Front Case Removal/Replacement

The chassis must be removed to access and remove other components that are fastened to the chassis body. The front case is set in slots in the bottom case and both are removed from the chassis as a unit. The chassis is held in the printer case by two tabs, which can reached through two access slots in the bottom of the printer. To simplify the process of removing the chassis from the printer, follow these instructions closely.

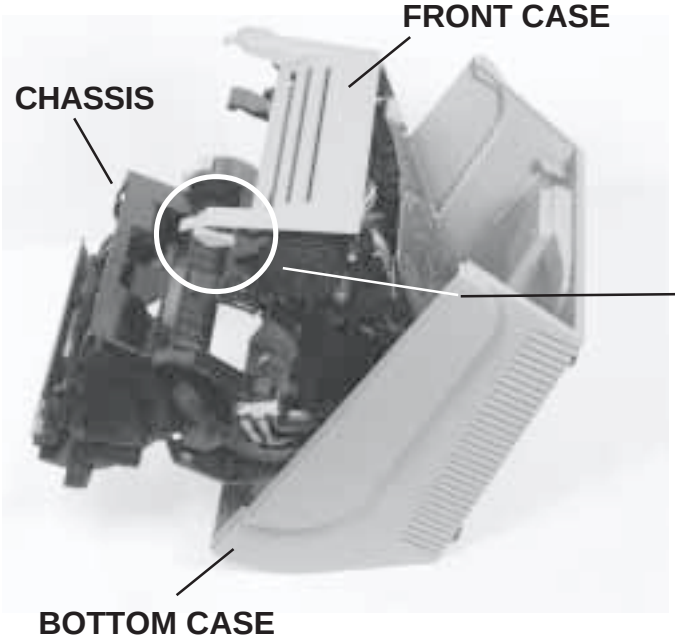
REFER TO THE ACCOMPANYING ILLUSTRATIONS

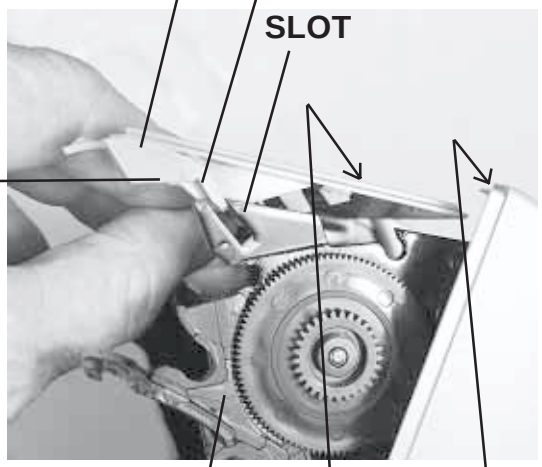
To remove the chassis:

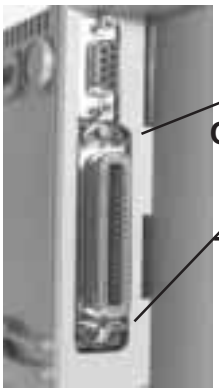
Insert a flat-bladed screwdriver into each of the two chassis release slots between the tabs and case and push the screwdriver in the direction shown. For the right side slot, insert the screwdriver and push toward the front of the printer. For the left side slot, insert the screwdriver and push toward the rear of the printer while pulling the chassis away from the printer case. The front case will come out with the chassis. Lift the front case from the chassis.


INSERT SCREWDRIVER INTO EACH SLOT, PUSH UP ON THE RIGHT SIDE, PUSH DOWN ON THE LEFT SIDE
PUSH UP TO THE FRONT
CASE
TAB
INSERT SCREWDRIVER BETWEEN TAB AND CASE
RIGHT SIDE TAB
PUSH DOWN TO THE REAR
LEFT SIDE TAB

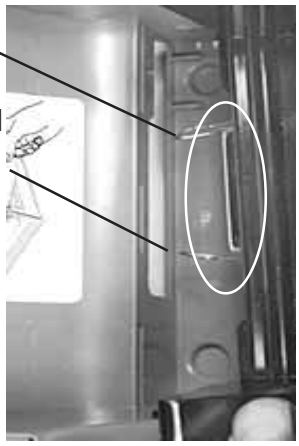
3-4 Chassis, Including Front Case Removal/Replacement (Continued)







WIRE TABS ON THE CENTRONICS CONNECTOR MUST BE IN A FORWARD POSITION WHEN INSERTED THROUGH THE OPENING IN THE CASE



SLIDE THE EDGES ON THE FRONT CASE INTO THE RECESSES ON THE BOTTOM CASE

To replace the chassis and front case:

1. While lowering the chassis into the bottom case, guide the communication port connectors through the slot in the bottom rear of the bottom case. Do not press the chassis all the way down yet; just lower it gently into position.
2. Position the front case on the front of the printer chassis. The small ledges at the sides of the front case serrated edges fit into slots at the left and right sides of the chassis.
3. Carefully guide the Centronics connector on the chassis into the opening on the case so that the wire tabs are in a forward position when inserted through the case. Gently press the printer chassis all the way down into the bottom case while guiding the side edges on the front case into the recesses of the bottom case.

3-5 Platen Removal/Replacement

REFER TO THE ACCOMPANYING ILLUSTRATIONS

Platen removal:

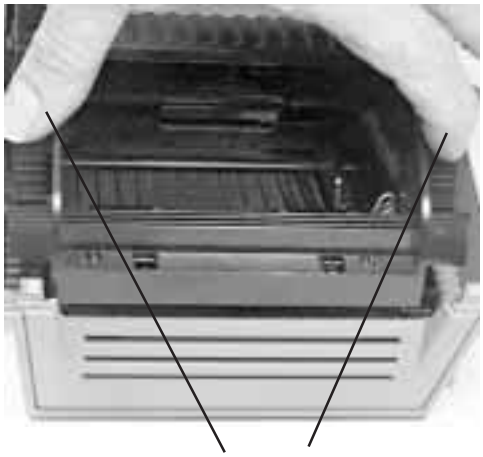
1. Raise the top case.

2. Press the two print head release latches back to release the print head, then lift the print head until it is fully raised and latched in the open position.

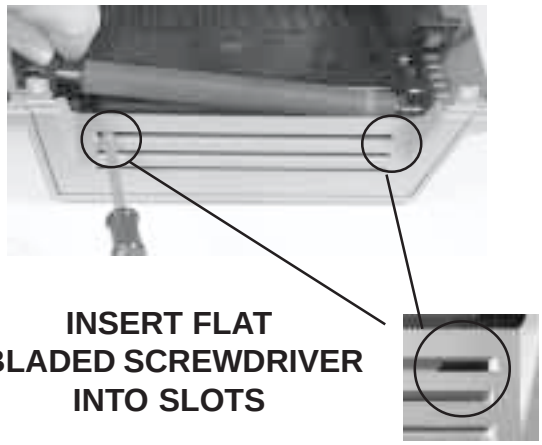
3. Insert a flat-bladed screwdriver into the right slot on the front case. Press down on the screwdriver to force the platen up on the right side. This will release the right end of the platen.

4. Repeat steps 2 and 3 using the slot on the left side of the front case. This will release the left end of the platen.

5. Lift the platen clear of the chassis.



PRESS BACK THE RELEASES TO UNLOCK



INSERT FLAT BLADED SCREWDRIVER INTO SLOTS

Platen installation:

Lower the platen into the printer chassis and press down until it snaps into place.

3-6 Print Head Removal/Replacement

REFER TO THE ACCOMPANYING ILLUSTRATIONS

Print head removal:

1. Raise the top case.

2. Press the two print head release latches back to release the print head, then lift the print head until it is fully raised and latched in the open position.

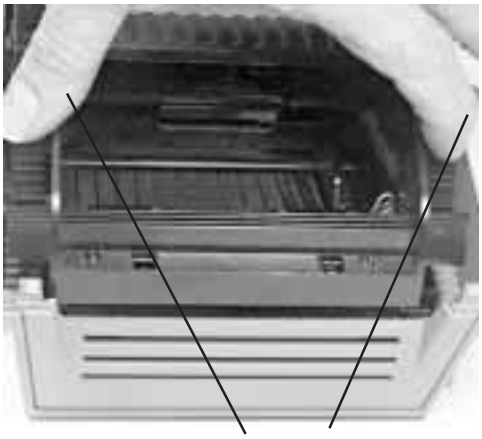
3. Press the print head down with your thumbs (towards the printer chassis) and slide the front edges away from the slots on the printer frame.

4. Pull the print head away from the printer frame and rotate towards you so that the springs are facing your direction.

5. Unplug the print head ground lead from its push-on connector on the print head. Unplug the sensor LED connector.

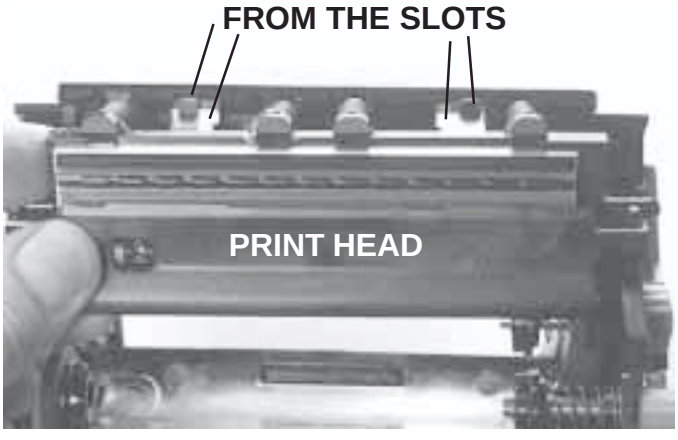
> *NOTE:*
> *The sensor LED is polarity-sensitive; observe the orientation of the LED connector when disconnecting and reconnecting it. The red lead should be closest to the print head.*

6. Unplug the print head connector.

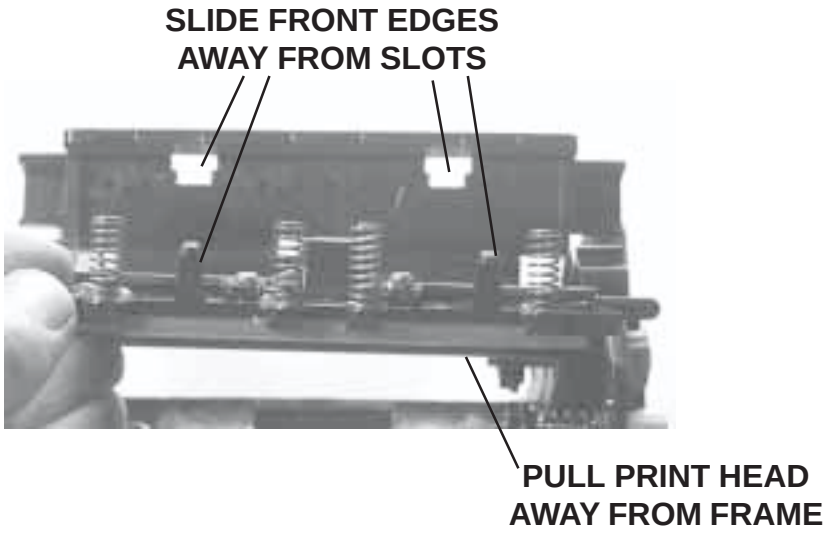


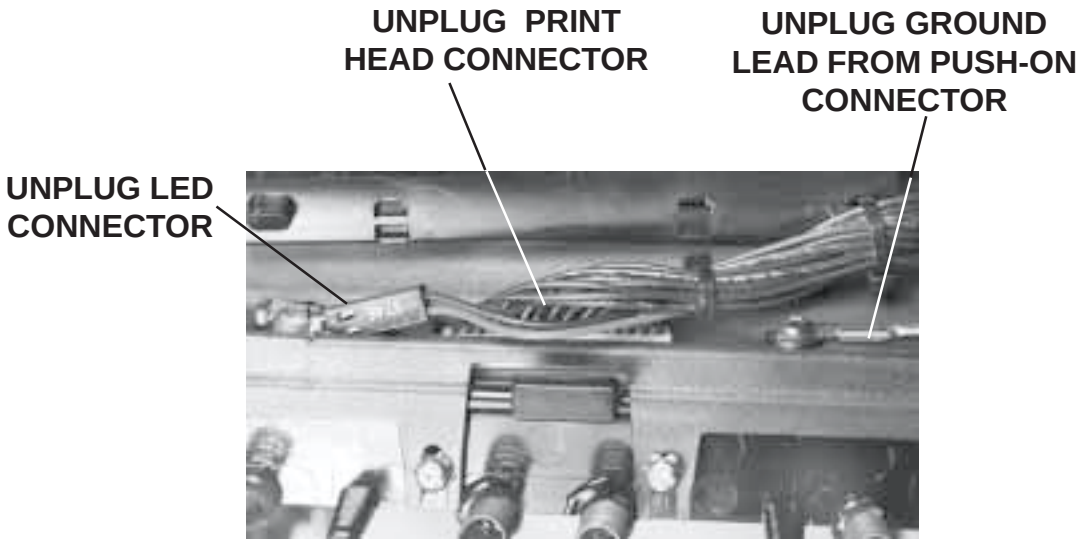
PRESS BACK THE RELEASES TO UNLOCK

PRESS PRINT HEAD DOWN AND SLIDE FRONT EDGES AWAY FROM THE SLOTS



3-6 Print head Removal/Replacement





Print head installation:

Reverse the above steps to install the print head.

3-7 PCBA Module Removal/Replacement

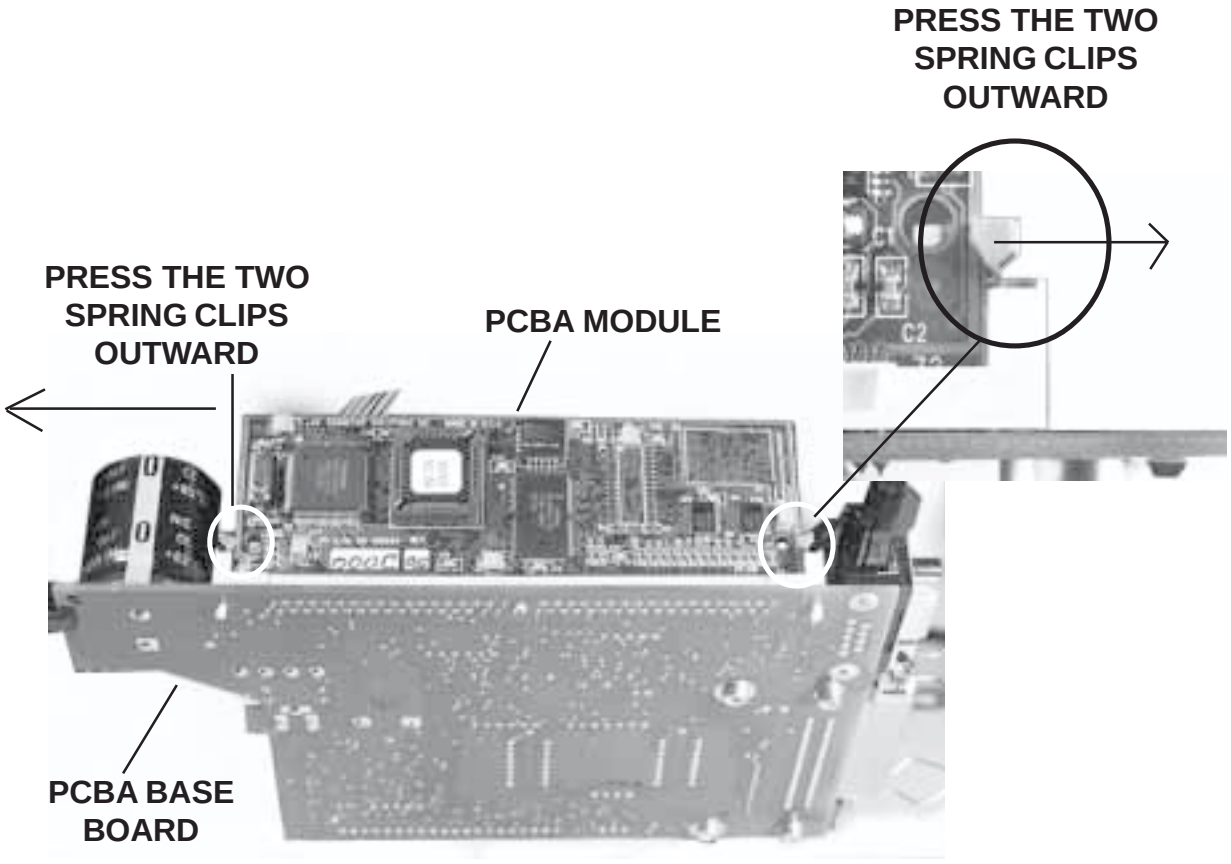
REFER TO THE ACCOMPANYING ILLUSTRATIONS

Module removal:

1. Remove the printer chassis according to the instructions in Section 3-4.

2. Remove the module from the PCBA base board by pressing outward on the two spring clips at the left and right ends of the module .

3. Lift the module up and out to remove.



Module replacement:

1. Press the module firmly into its connector on the PCBA base board.

2. Press the top edge of the module in toward the printer body until the connector spring clips engage.

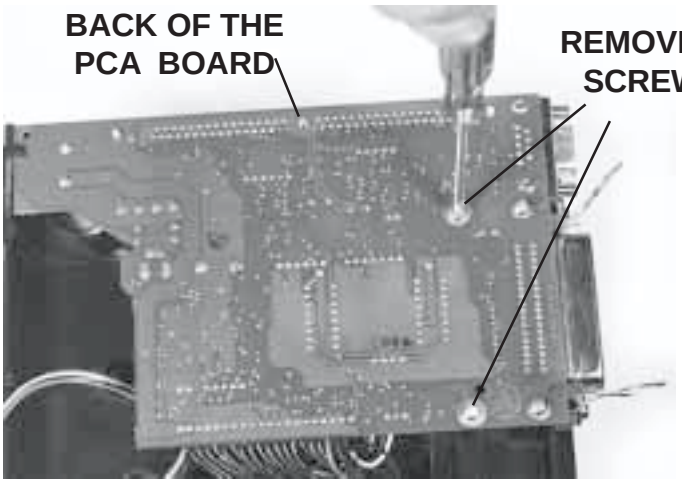
3. Reinstall the chassis in the case according to the directions in Section 3-4.

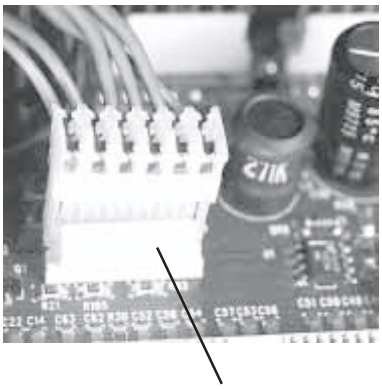
3-8 PCA Base Board Removal/Replacement

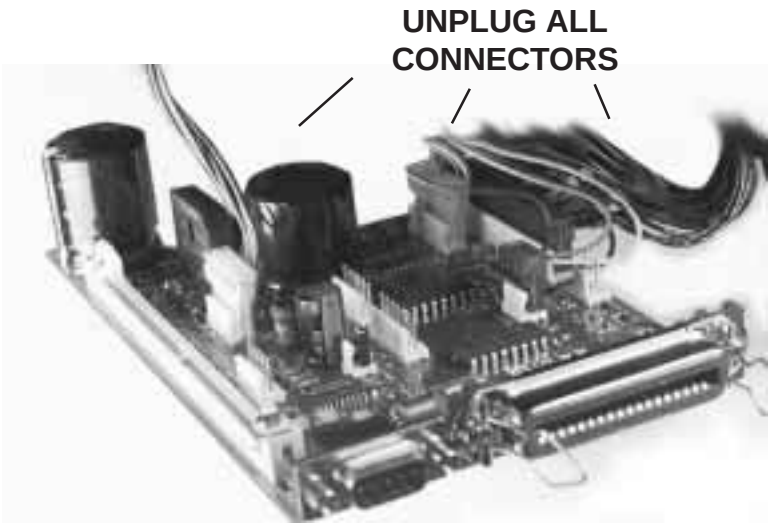
REFER TO THE ACCOMPANYING ILLUSTRATIONS

PCA board removal:

1. Remove the printer chassis according to the instructions in Section 3-4.
2. Remove the module from the main PCA board according to the instructions in Section 3-7.
3. Remove the two Phillips-head screws holding the main PCA board in place.
4. Lift the PCA board gently, then unplug the feed switch connector at J13.
5. Turn the PCA board over and unplug all other connectors.







PCA board installation:

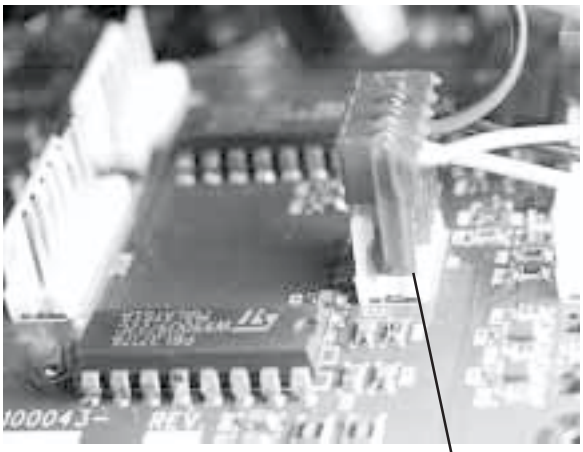
Reverse the above steps to install the main PCA board.

3-9 Motor Removal/Replacement

REFER TO THE ACCOMPANYING ILLUSTRATIONS

Motor removal:

1. Remove the printer chassis according to the instructions in Section 3-4.
2. Remove the two Phillips-head screws holding the PCA base board in place.
3. Lift the PCA base board gently, then unplug the feed switch connector at J13
4. Unplug the motor wiring at connector J10
5. Remove the Phillips-head screw holding the motor in place.
6. Turn the motor body until the motor flanges clear the printer chassis, then remove the motor.



UNPLUG THE CONNECTOR AT J10

REMOVE PHILLIPS-HEAD SCREW AND LIFT THE MOTOR

Motor installation:

Reverse the above steps to install the motor.

3-10 Head Open Switch Removal/Replacement

REFER TO THE ACCOMPANYING ILLUSTRATIONS

Switch removal:

1. Remove the printer chassis according to the instructions in Section 3-4.

2. Insert a flat-bladed screwdriver under the switch body and gently pry it up to detach from the chassis protrusions.

3. Unplug the two connectors.

Switch installation:

Reverse the above steps to install the switch.

3-11 Cluster Gear Removal/Replacement (Continued)

REFER TO THE ACCOMPANYING ILLUSTRATIONS

Cluster gear removal:

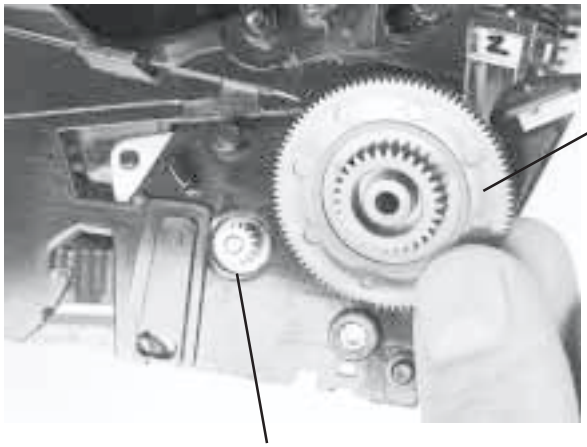
1. Remove the chassis according to the instructions in Section 3-4.

2. Remove the platen according to the instructions in Section 3-5.

3. Turn the chassis so that its right side rests on the work surface. The drive gears should be facing you. If you are servicing a direct thermal printer, there will be only two gears, the motor drive gear (brass) and the cluster gear (black plastic).

> *NOTE:*
> *The motor drive gear is permanently attached to the drive motor; do not attempt to remove it.*

4. Pull the damaged gear or gears off of the printer chassis.



Cluster gear installation:

Reverse the above steps to install the gear(s).

Section

4

Troubleshooting

4-1 Preliminary Tests

SATO printers are very reliable, so printing problems are unlikely. If you do think you have a printer problem, proceed as follows:

REFER TO THE ILLUSTRATIONS ELSEWHERE IN THIS MANUAL

1. Confirm that the printer has the right media installed, and that it is loaded correctly as described in this manual.

2. Confirm that the printer is connected to its power supply and the supply is plugged into an AC outlet having the proper voltage. Measure the voltage at the output of the power supply. It should be 24V +/- 10%.

3. Open the print head and inspect the media path. Remove any obstructions, and clean the print head and drive roller according to the instructions in this manual.

4. Press down firmly on both print head latches to confirm that they are closed.

5. Confirm that the printer READY indicator glows green.

6. Print a self-test label as described in this manual. (Page 26)

7. Press FEED to confirm that the printer will feed a label.

8. Review the common problems described in this section.

Note:
The information here assumes you are using label printing software. If you are programming the printer, please review the information in the CXProg.pdf file located on the CD-ROM.

4-2 Common Problems and Their Solutions

READY light is not lit

1. Press the READY light.
2. Double-check the AC source and the power supply connections.
3. Disconnect the cable between the printer and the host, then reset the printer as described in this manual.
4. If the READY light glows green with the host disconnected, suspect a host computer or cabling problem.

READY light glows red

1. Press the FEED switch to assure that the printer is not paused in batch mode printing.
2. Confirm that the print media is not exhausted.
3. Confirm that the print head is securely latched down on both sides.
4. If you have printed many labels, the printer may have overheated. Normal operation will resume after the printer has cooled sufficiently.

Self-test label will not print

1. Confirm that you have loaded direct thermal media if the unit is a CX200DT.
2. Disconnect the cable between the printer and the host computer. Reset the printer as described in this manual, then try to print a self-test label again.
3. Confirm that the coated (dull) side of the ribbon (CX200TT) is on the outside where it will be in contact with the label media.

Labels will not feed

1. Confirm that the print media is loaded correctly.
2. Reset the printer as described in this manual. Confirm that the printer LED indicator glows green. Press the FEED button.
3. If the printer still does not feed, disconnect the communications cable and repeat step 2. If the printer feeds with the cable disconnected, suspect a problem with the host computer or cable.

4-2 Common Problems and Their Solutions (Continued)

Host stops responding or displays "printer not ready" message

1. Review your software setup, following the instructions provided with the software.

2. Confirm that the host-to-printer communication cable is connected and undamaged. If using the serial port, confirm that you are using a null modem cable or adapter.

3. If using the serial port, confirm that the host and printer are both using the same serial port parameters. The self-test label shows the current printer serial port parameters.

4. If using a communications switch between the host and printer, remove the switch and connect the printer directly to the host.

5. Reset the printer as described in this manual, reset the host computer and software, and try printing again.

Host stops responding or displays "printer not ready" message

1. Review your software setup, following the instructions provided with the software.

2. Confirm that the host-to-printer communication cable is connected and undamaged. If using the serial port, confirm that you are using a null modem cable or adapter.

Poor print quality

1. Confirm that the print media is properly loaded, and there is no side-to-side motion of the paper as it feeds through the printer.

2. Check your software's print darkness and print speed settings. These settings may need adjustment for optimum results.

3. Try different print media. Old or inferior quality media will degrade print quality.

4-2 Common Problems and Their Solutions (Continued)

Printer feeds too many labels

1. Verify correct label loading (Eye-Mark bars, if any facing down).
2. Print a test label to confirm that the printer is set for the proper sensor type. If the sensor type does not match the currently loaded print media, either change the media or change the sensor setting using the SELECT SENSOR command.
3. If using Eye-Mark indexing, confirm that the label stock has good black bars at least 1/8" wide and that the bars are positioned to pass over the reflective optical detector. The reflectance of the black bars should not exceed 12% maximum at a wave length of 850 nanometers.
4. If using gap indexing, confirm that the label stock has a minimum 1/8" gap between each label.
5. Confirm that the sensor and LED light source are both unobstructed.
6. Recalibrate the printer according to the instructions in this manual. If none of the above steps correct the problem, the label sensor may be defective.

Printed bar codes won't scan

1. Confirm that the commands you are sending to the printer will print a bar code that conforms to a standard bar code symbology. Confirm that the characters you are attempting to encode are legitimate characters for the selected bar code type.
2. Confirm that the scanner is set up to scan the bar code type you are printing.
3. Confirm that the print head is clean. Clean it if required. Check the overall print quality. If the print quality is poor, proceed as for "Poor print quality."
4. If you are using direct thermal printing and an infrared scanner, confirm that your direct thermal paper is infrared scannable as follows:
   - A. Print a bar code.
   - B. Photocopy the printed bar code on a plain-paper copier.
   - C. Scan the photocopy. If the copy scans properly and the original does not, your direct thermal label stock is not infrared scannable.
   - D. Inspect and confirm that the print head is not damaged.
   - E. Run a Self Test label and examine the head pattern.

4-2 Common Problems and Their Solutions (Continued)

Ribbon wrinkles

Occasional ribbon wrinkling may not indicate a printer problem, but if wrinkling occurs often, check the following:

1. Raise the print head.

2. Confirm that the ribbon cores are correctly seated on the ribbon spindles.

3. Turn the ribbon take-up knob clockwise and confirm that the ribbon runs smoothly. If the ribbon binds, remove the ribbon cores and examine the ribbon spools, spool springs, and gears for possible damage. Remove any label debris or other obstructions.

4. Close the print head. Confirm that the ribbon take-up gears engage properly.

5. Resume normal operation If the problem persists, try replacing the ribbon. A damaged or inferior quality ribbon may wrinkle easily, especially with high heat settings.

Printer skips labels while printing

1. Confirm that the printer will feed one label at a time using the FEED switch. If the printer feeds more than one label when you press the feed switch, see "Printer feeds too many labels" for troubleshooting information.

2. If using eye-mark indexing, confirm that there are black bars printed on the back of every label and that the index bars are positioned such that they pass over the sensor. If using gap sensing, confirm that there is a uniform gap (at least 1/8" wide) between each label.

3. Print a test label to confirm that you have selected the proper sensing method for your label media.

4. Calibrate the label sensor according to the procedure in this manual.

5. Confirm that the label sensor is not obstructed. Clean if required.

6. Confirm that the label as defined by the label format is smaller than the physical label size.

If none of the above steps correct the problem, the label sensor may be defective.

4-2 Common Problems and Their Solutions (Continued)

Host stops responding or displays "printer not ready" message

1. Review your software setup, following the instructions provided with the software.

2. Confirm that the host-to-printer communication cable is connected and undamaged. If using the serial port, confirm that you are using a null modem cable or adapter.

3. If using the serial port, confirm that the host and printer are both using the same serial port parameters. The self-test label shows the current printer serial port parameters.

4. If using a communications switch between the host and printer, remove the switch and connect the printer directly to the host.

5. Reset the printer as described in this manual, reset the host computer and software, and try printing again.

Printed labels are cut off at the bottom

1. If every label printed by a given format is cut off at the bottom, the label may be too large for the available printer memory.

2. If just the first printed label is cut off at the bottom, the label stock may not have been properly positioned in the printer. The printer may print a partial label before it corrects the index position if the label stock was not manually indexed after installation. You can avoid this occurrence by pressing the FEED switch once to feed one label after you close the printer.
   Note: Pressing the FEED switch while the Ready light glows green, will reprint any label not cleared from memory.

If none of the above solves your problem ...

If the printer still does not work after following the above procedures, you should suspect trouble with the installed firmware, nonvolatile RAM settings, or the main printed circuit board. In that event, we suggest performing a full printer calibration and test. Refer to this manual for instructions.

If this still does not resolve the problem, assume the main printed circuit board and label sensor module are defective. Replace both components and recalibrate.